

ABSTRACT OF THE DISCLOSURE

A femtosecond laser based laser processing system having a femtosecond laser, frequency conversion optics, beam manipulation optics, target motion control, processing chamber, diagnostic systems and system control modules. The femtosecond laser based laser processing system allows for the utilization of the unique heat control in micromachining, and the system has greater output beam stability, continuously variable repetition rate and unique temporal beam shaping capabilities.